Amendments to the Claims

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. (Original) A desiccation device comprising:

a body that comprises a plurality of chambers wherein at least one chamber is a desiccation chamber that comprises:

i) a sidewall that at least partially defines a first volume, a second volume in direct fluid communication with the first volume, and a sample volume in direct fluid communication with the second volume, wherein the second volume separates the first volume from the sample volume;

ii) at least one gas inlet located in the sidewall of the desiccation chamber and in direct fluid communication with the first volume;

iii) a gas vent in fluid communication with the first volume; and

iv) a sample opening in fluid communication with the sample volume.

2. (Original) The device of claim 1 further comprising a supply plenum in fluid communication with a supply of desiccation gas and also in fluid communication with one or more gas inlets of one or more desiccation chambers.

3. (Original) The device of claim 1 further comprising a vent plenum in fluid communication with one or more gas vents of one or more desiccation chambers.

4. (Original) The device of claim 1 wherein at least one desiccation chamber comprises a longitudinal axis extending through the first volume, the second volume and the sample volume, and wherein the gas inlet is oriented to direct desiccation gas into the first volume in a direction that is on a plane that is substantially transverse to the longitudinal axis.

5. (Original) The device of claim 1 wherein at least one desiccation chamber sidewall comprises a portion that defines a curve having a tangent, and wherein the gas inlet is oriented to direct desiccation gas into the first volume in a direction that is substantially parallel to the tangent of the curve.

6. (Original) The device of claim 5 wherein the gas inlet is oriented to direct desiccation gas into the first volume along a line that is substantially tangential to the curve and intersects with the sidewall at the gas inlet.

7. (Original) The device of claim 1 wherein, in at least one desiccation chamber, the gas inlet is closer to the sample volume than is the gas vent.

8. (Original) The device of claim 1 wherein, in at least one desiccation chamber, the gas vent is closer to the sample volume than is the gas inlet.

9. (Original) The device of claim 1 wherein at least one desiccation chamber comprises a plurality of gas inlets.

10. (Original) The device of claim 1 wherein at least one desiccation chamber comprises a plurality of gas vents.

11. (Original) The device of claim 1 wherein at least one desiccation chamber further comprises a drain port in fluid communication with the sample volume.

12. (Original) The device of claim 1 wherein at least one desiccation chamber further comprises a membrane in fluid communication with the sample volume.

13. (Original) The device of claim 1 wherein at least one desiccation chamber further

comprises a valve in fluid communication with the sample volume.

14. (Original) A sample processing module capable of processing a plurality of liquid samples, the module comprising:

at least one concentrator element comprising:

a body that comprises a plurality of concentrator chambers, each concentrator chamber comprising:

i) a sidewall located between generally opposed openings that at least partially defines a first volume,

ii) at least one gas inlet located in the sidewall and in direct fluid communication with the first volume, and

iii) a gas vent in fluid communication with the first volume; and

at least one processing element comprising a body that comprises a plurality of processing chambers formed in the body, wherein each processing chamber comprises a sample volume and at least a portion of a second volume;

wherein the at least one processing element is configured so that when the at least one concentrator element is assembled with the at least one processing element to form the module, one or more processing chambers is in direct fluid communication with one or more concentrator chambers.

15. (Original) The sample processing module of element 14 wherein at least one processing chamber in fluid communication with at least one concentrator chamber forms a desiccation chamber comprising the first volume, the second volume and the sample volume.

16. (Original) The module of claim 15 further comprising a supply plenum in fluid communication with a supply of desiccation gas and also in fluid communication with at least one desiccation chamber.

17. (Original) The module of claim 15 further comprising a vent plenum in fluid communication with at least one desiccation chamber.

18. (Original) The module of claim 15 wherein at least one desiccation chamber further comprises a longitudinal axis extending through the first volume, and wherein the gas inlet is oriented to direct desiccation gas into the desiccation chamber in a direction that is on a plane that is substantially transverse to the longitudinal axis.

19. (Original) The module of claim 15 wherein at least one desiccation chamber sidewall comprises a portion that defines a curve having a tangent, and wherein the gas inlet is oriented to direct desiccation gas into the desiccation chamber in a direction that is substantially parallel to the tangent of the curve.

20. (Original) The module of claim 19 wherein the gas inlet is oriented to direct desiccation gas into the desiccation chamber along a line that is substantially tangential to the curve and intersects with the sidewall at the gas inlet.

21. (Original) The module of claim 15 wherein, in at least one desiccation chamber, the gas inlet is closer to the processing element than is the gas vent.

22. (Original) The module of claim 15 wherein, in at least one desiccation chamber, the gas vent is closer to the processing element than is the gas inlet.

23. (Original) The module of claim 15 wherein at least one desiccation chamber comprises a plurality of gas inlets.

24. (Original) The module of claim 15 wherein at least one desiccation chamber comprises a plurality of gas vents.

25. (Original) The module of claim 14 wherein at least one processing chamber further comprises at least one drain port in fluid communication with the sample volume.

26. (Original) The module of claim 14 wherein at least one processing chamber further comprises a membrane in fluid communication with the sample volume.

27. (Original) The module of claim 14 wherein at least one processing chamber further comprises a valve in fluid communication with the sample volume.

28. (Original) The module of claim 14 wherein the concentrator element is reusable.

29. (Original) The module of claim 14 wherein the processing element is disposable after one use.

30. (Original) A sample processing system capable of processing a plurality of liquid samples comprising two or more of the sample processing modules of claim 14.

31. (Original) The system of claim 30 further comprising a supply of desiccation gas in fluid communication with at least one concentrator chamber of at least one sample processing module.

32. (Original) The system of claim 30 further comprising a control element for regulating the processing of the liquid samples.

33. (Original) The system of claim 32 wherein the control element is configured to regulate the temperature of a sample.

34. (Original) The system of claim 32 wherein the control element is configured to regulate the movement of at least one sample from one module in the system to another module in the system.

35. (Original) The system of claim 30 wherein the system further comprises delivery means for delivering one or more samples to a sample receiving module, and wherein the sample receiving module is configured for receiving one or more samples from the delivery means.

36. (Original) A method of concentrating a liquid sample, the method comprising:

providing a device comprising a plurality of chambers, wherein at least one chamber is a desiccation chamber that comprises:

i) a sidewall that at least partially defines a first volume, a second volume in direct fluid communication with the first volume, a sample volume in direct fluid communication with the second volume,

ii) at least one gas inlet located in the sidewall and in direct fluid communication with the first volume and also in fluid communication with a supply of desiccation gas, and

iii) a gas vent in direct or indirect fluid communication with the first volume;

providing a liquid sample to two or more desiccation chambers;

introducing desiccation gas through the gas inlet into the first volume of the two or more desiccation chambers to which a liquid sample has been provided, thereby concentrating the liquid samples; and

removing at least a portion of the desiccation gas through the gas vents of at least a portion of the two or more desiccation chambers to which a liquid sample has been provided;

wherein at least two liquid samples are concentrated substantially simultaneously.

37. (Original) The method of claim 36 wherein the desiccation gas is introduced to the two or more desiccation chambers to which a liquid sample has been provided substantially

simultaneously.

38. (Original) The method of claim 37 wherein the desiccation gas is removed from the two or more desiccation chambers to which a liquid sample has been provided substantially simultaneously.

39. (Original) The method of claim 36 wherein the desiccation gas is removed from the two or more desiccation chambers to which a liquid sample has been provided substantially simultaneously.

40. (Original) The method of claim 36 wherein introducing the desiccation gas comprises providing a pressure differential between the gas inlet and the gas vent.

41. (Original) The method of claim 40 wherein introducing the desiccation gas comprises injecting desiccation gas into the first volume under a pressure greater than ambient pressure within the chamber.

42. (Original) The method of claim 36 wherein removing the desiccation gas comprises providing a pressure differential between the gas inlet and the gas vent.

43. (Original) The method of claim 42 wherein removing the desiccation gas comprises providing a vacuum through the vent that is at lower pressure than ambient pressure within the chamber.

44. (Original) The method of claim 36 wherein at least one desiccation chamber comprises a longitudinal axis extending through the first volume, second volume and sample volume, and wherein introducing the desiccation gas comprises directing the desiccation gas into the first volume in a direction that is substantially transverse to the longitudinal axis.

45. (Original) The method of claim 36 wherein at least one desiccation chamber sidewall comprises a portion that defines a curve having a tangent, and wherein introducing the desiccation gas comprises directing the desiccation gas into the first volume in a direction that is substantially parallel to the tangent of the curve.

46. (Original) The method of claim 45 wherein directing the desiccation gas comprises directing the desiccation gas into the first volume along a line that is substantially tangential to the curve and intersects with the sidewall at the gas inlet.

47. (Original) The method claim 36 further comprising heating the desiccation gas outside of the plurality of chambers.

48. (Original) The method claim 36 further comprising chilling the desiccation gas outside of the plurality of chambers.

49. (Original) The method claim 36 further comprising drying the desiccation gas outside of the plurality of chambers.

50. (Original) The method claim 36 wherein at least one desiccation chamber comprises a drain port in fluid communication with the sample volume, and wherein the method further comprises draining at least a portion of the sample from the at least one desiccation chamber through the drain port.

51. (Original) The method claim 50 wherein at least one desiccation chamber further comprises a membrane that separates the sample volume from the drain port and also is capable of filtering the liquid sample, and wherein the draining step comprises filtering the portion of the liquid sample being drained.

52. (Original) The method of claim 50 wherein at least one desiccation chamber further comprises an activated membrane that separates the sample volume from the drain port and also is capable of adsorbing one or more solutes of the liquid sample, and wherein the draining step comprises adsorbing one or more solutes of the sample.

53. (Original) The method of claim 50 wherein draining the liquid sample from at least one desiccation chamber is regulated by a control element.

54. (Original) The method of claim 53 wherein the control element regulates pressure inside the at least one desiccation chamber, at the drain port of the at least one desiccation chamber, or both, thereby regulating a pressure differential between the drain port and inside the desiccation chamber.

55. (Original) The method of claim 54 wherein the pressure differential is formed by increasing the pressure inside the desiccation chamber by introducing gas into the desiccation chamber.

56. (Original) The method of claim 54 wherein the pressure differential is formed by decreasing the pressure at the drain port.

57. (Original) The method of claim 36 wherein the device comprises:

a concentrator element comprising the at least one gas inlet, the gas vent and the first volume; and

a processing element comprising the second volume the sample volume and at least a portion of the second volume;

wherein the concentrator element and the processing element are separable and capable of being assembled to form the device.

58. (Original) The method of claim 36 wherein the sample comprises a protein, a peptide, an oligonucleotide, a DNA, a RNA, a lipid, a phospholipid, a steroid, a hormone, a labeled derivative of any of the foregoing, or any combination of any of the foregoing.

59. (New) The device of claim 1, wherein the gas vent is located in the sidewall of the desiccation chamber.

60. (New) The device of claim 1, wherein at least one desiccation chamber sidewall comprises a portion that defines a curve having a tangent, and wherein the gas inlet is oriented to direct desiccation gas into the first volume in a direction that is substantially parallel to the tangent of the curve, and wherein the gas vent is located in the desiccation chamber sidewall.

61. (New) The module of claim 14, wherein the gas vent is located in the sidewall of the concentrator chamber.

62. (New) The module of claim 14, wherein the sidewall of the concentrator chamber comprises a portion that defines a curve having a tangent, and wherein the gas inlet is oriented to direct desiccation gas into the first volume in a direction that is substantially parallel to the tangent of the curve, and wherein the gas vent is located in the sidewall.

63. (New) The method of claim 36, wherein the liquid sample is located within the sample volume of the two or more desiccation chambers, and wherein introducing desiccation gas into the first volume of the two or more desiccation chambers comprises forming a vortex of the desiccation gas within the first volume of the two or more desiccation chambers, wherein the second volume separates the first volume and the vortex formed therein from the liquid sample in the sample volume.